United States Patent [19]

Ward et al.

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[54] **MODIFIED NUCLEOTIDES AND METHODS OF PREPARING AND USING SAME**

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Related U.S. Application Data

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[51] **Int. Cl.**[4] C07H 17/02; C07H 19/06; C07H 19/02

[52] **U.S. Cl.** **536/29**; 536/23; 536/24; 536/26; 536/27; 536/28

[58] **Field of Search** 536/27, 28, 29, 26, 536/24, 23; 435/5, 6

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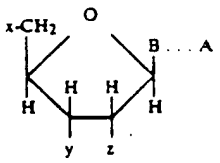
[57] **ABSTRACT**

Compounds having the structure:

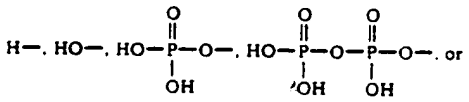


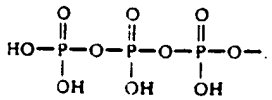
wherein B represents a purine, 7-deazapurine, or pyrimidine moiety covalently bonded to the $C^{1'}$-position of the sugar moiety, provided that when B is purine or 7-deazapurine, it is attached at the N^9-position of the purine or 7-deazapurine and when B is pyrimidine, it is attached at the N^1-position;

wherein A represents a moiety consisting of at least three carbon atoms which is capable of forming a detectable complex with a polypeptide when the compound is incorporated into a double-stranded ribonucleic acid, deoxyribonucleic acid duplex, or DNA-RNA hybrid;

wherein the dotted line represents a chemical linkage joining B and A, provided that if B is purine, the linkage is attached to the 8-position of the purine, if B is 7-deazapurine, the linkage is attached to the 7-position of the deazapurine, and if B is pyrimidine, the linkage is attached to the 5-position of the pyrimidine and

wherein each of x, y and z represents





either directly, or when incorporated into oligo- and polynucleotides, provide probes which are widely useful.

Applications include detection and localization of polynucleotide sequences in chromosomes, fixed cells, tissue sections, and cell extracts. Specific applications include chromosomal karyotyping, clinical diagnosis of nucleic acid-containing etiological agents, e.g. bacteria, viruses, or fungi, and diagnosis of genetic disorders.

21 Claims, No Drawings